Changes are shown using underlines and strikeouts. Any claim not accompanied by a marked up version has not been changed relative to the immediate prior version.

Claim 1 (amended). An injection system for the delivery of a gaseous substance from a container to a patient pulmonary respiratory system through a conduit coupled to the patient pulmonary respiratory system; said injection system comprising:

a control unit controlling said injection system;

a valve assembly in connection with the conduit to selectively allow delivery of the gaseous substance from the container to the conduit; said valve assembly including a valve and valve actuating means allowing variable opening of said valve; said valve actuating means being coupled to said control unit to be controlled thereby; and

a flowmeter quantitatively measuring inspiratory gas flow in the conduit; said flowmeter being coupled to said control unit to supply inspiratory gas flow data thereto;

wherein a) said control unit controls said valve assembly so that said variable opening of said valve is responsive to said inspiratory gas flow in the conduit so as to achieve a predetermined concentration of the gaseous substance with respect to the inspiratory gas, and b) said predetermined concentration varies within a plurality of inspiratory phases of the patient.

2. An injection system as recited in claim 1, wherein said variable opening of said valve is proportionally responsive to said inspiratory gas flow in the conduit.

3. An injection system as recited in claim 1, wherein said control unit opens said valve in response to said inspiratory gas flow when said inspiratory gas flow exceeds a predetermined threshold level; said injection system therefore delivering the gaseous substance only when the patient is in an inspiratory phase.

4. An injection system as recited in claim 3, wherein said control unit includes an alarm actuated when a duration between two consecutive inspiratory phases exceeds a predetermined duration limit.

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5. An injection system as recited in claim 3, wherein said control unit includes an alarm actuated when a duration of an inspiratory phase exceeds a predetermined duration limit.

6. An injection system as recited in claims 4 or 5, wherein said injection system is deactivated when said alarm is actuated.

7. An injection system as recited in claim 1, wherein said controlling unit includes a user interface unit configured to receive inputs from a user and to display data to the user.

Claim 8 (amended). An injection system as recited in claim 1, wherein said gaseous substance includes nitric oxide.

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Claim 9 (amended). An injection system for the delivery of a gaseous substance from a container to a patient pulmonary respiratory system through a conduit coupled to the patient pulmonary respiratory system; the pulmonary respiratory system of the patient being also coupled to a ventilator forcing inspiratory gas therein; said injection system comprising:

a control unit controlling said injection system; said control unit receiving inspiratory gas flow data from the ventilator; and

a valve assembly in connection with the conduit to selectively allow delivery of the gaseous substance from the container to the conduit; said valve assembly including a valve and valve actuating means allowing variable opening of said valve; said valve actuating means being coupled to said control unit to be controlled thereby;

wherein a) said control unit controls said valve assembly so that said variable opening of said valve is responsive to said inspiratory gas flow supplied to the patient so as to achieve a predetermined concentration of the gaseous substance with respect to the inspiratory gas, and b) said predetermined concentration varies within a plurality of inspiratory phases of the patient.

10. An injection system as recited in claim 9, wherein said variable opening of said valve is proportionally responsive to said inspiratory gas flow forced by the ventilator in the respiratory system of the patient.

11. An injection system as recited in claim 9, wherein said control unit opens said valve in response to said inspiratory gas flow when said inspiratory gas flow exceeds a predetermined threshold level; said injection system therefore delivering the gaseous substance only when the patient is in an inspiratory phase.

12. An injection system as recited in claim 11, wherein said control unit includes an alarm actuated when a duration between two consecutive inspiratory phases exceeds a predetermined duration limit.

13. An injection system as recited in claim 11, wherein said control unit includes an alarm actuated when a duration of an inspiratory phase exceeds a predetermined duration limit.

14. An injection system as recited in claims 12 or 13, wherein said injection system is deactivated when said alarm is actuated.

15. An injection system as recited in claim 9, wherein said controlling unit includes a user interface unit configured to receive inputs from a user and to display data to the user

Claim 16 (amended). An injection system as recited in claim 9, wherein said gaseous substance includes nitric oxide.